

(see column 3, lines 64-66). The insulating adhesive layer 2 of Saitoh is used for connecting the metal plate 1 with the metal layer 5B.

Claim 1 of the present application defines a metal-ceramic circuit board comprising a base plate of aluminum or aluminum alloy and a ceramic substrate board, wherein one surface of the ceramic substrate board is bonded directly to the base plate.

Saitoh does not disclose or suggest the direct bonding of a ceramic substrate board to a base metal plate.

Ikeda does not cure the deficiencies of Saitoh.

As disclosed in the present application, the ceramic substrate board is bonded directly to the metal base plate so that the following advantages can be obtained:

1. When the circuit board is subject to repeated cooling and heating, the reliability of the metal-ceramic circuit board is improved, because the structure between the ceramic substrate board and the base plate is simple.
2. A high heat conductivity can be obtained because the structure between the ceramic substrate board and the base plate is simple.
3. The cost of manufacturing can be reduced because any brazing for bonding the ceramic substrate board and the base plate can be omitted.
4. The base plate of aluminum or aluminum alloy of less than 320 MPA in proof stress and more than 1 mm in thickness is bonded directly to the ceramic substrate board, so that a bonding portion is very high in flexibility.

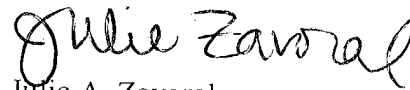
In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

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The Commissioner is hereby authorized to charge any additional fees which may be required in connection with this Amendment, or to credit any overpayment of fees to Deposit Account No. 50-2522.

Respectfully submitted,



Julie A. Zavoral
Attorney For Applicant
Registration No. 43,304

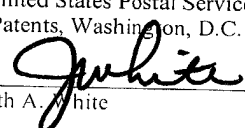
Dated: 30 December 2002
Customer No. 35110
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Milwaukee, Wisconsin 53202-5345
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Please grant any extension of time necessary for entry; charge any fee due to Deposit Account No. 50-2522.

CERTIFICATE OF MAILING

I hereby certify that this document is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on

30 December 2002
Date of Deposit


Judith A. White

ATTACHMENT - REDLINED AMENDMENT

Wherein deleted material is **[bracketed]** and new material is **underlined** as follows:

TITLE AS AMENDED

Please substitute the following amended title for the title as currently on record:

**METAL-CERAMIC CIRCUIT BOARD [AND MANUFACTURING METHOD
THEREOF]**

CLAIMS AS AMENDED

Please substitute the following amended claims for those currently pending:

1. (Once Amended) A metal-ceramic circuit board **[characterized by]** comprising a base plate of aluminum or aluminum alloy and a ceramic substrate board, wherein one surface of the ceramic substrate board is bonded directly to the base plate.

ABSTRACT AS AMENDED

Please substitute the following amended Abstract for the abstract as currently pending:

ABSTRACT OF THE DISCLOSURE

A metal-ceramic circuit board is characterized by being constituted by bonding **directly** on a base plate of aluminum or aluminum alloy at least one of ceramic substrate boards having a conductive metal member of an electronic circuit. **[A method of manufacturing a metal ceramic circuit board is characterized by comprising the steps of melting aluminum or aluminum alloy in a vacuum or inert gas atmosphere to form a molten metal contacting one surface of a ceramic substrate board directly with the molten metal in a vacuum or inert gas atmosphere, cooling the molten metal and the ceramic substrate board to form a base plate of aluminum or aluminum alloy, which is bonded directly on the ceramic substrate board without forming any oxidizing film therebetween and bonding a conductive metal**

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member of an electronic circuit on the ceramic substrate board by using a brazing material.] The base plate has a proof stress not higher than 320 (Mpa) and a thickness not smaller than 1mm.